

REMARKS

A minor grammatical change has been made to claim 1. The claims are otherwise unchanged.

The rejection of claims 1, 2, and 4-20 under 35 USC §103(a) in view of U.S. Patent No. 7,010,391 (Handique) and 2004/0062468 (Shipwash) is respectfully traversed on the grounds that the Handique patent and Shipwash publication fail to disclose or suggest an integrated analytic biochip in which:

- a **PCR reaction tank** is integrated into a microfluidic chip, and
- the PCR reaction tank is able to perform PCR reactions by detecting and controlling the **PCR recycling temperature** and **time** precisely *in the reaction tank*.

The Handique patent discloses a reaction/detection device 1 on the microfluidic chip, the reaction/detection device 1 including a temperature sensor and heater, but the temperature sensor and heater of Handique are embedded in the chip rather than being including in a reaction tank. This deficiency is not made up for by the Shipwash publication, which mentions heaters and temperature regulation but give no details concerning inclusion in a PCR reaction tank, much less formation of the heater and detector on a same layer within the tank.

Claim 1 of the present application specifically recites “*a micro reaction tank for containing samples . . .*,” and that the “*micro reaction tank comprises a micro heater for heating samples, and a micro temperature detector for detecting the temperature of samples in said micro reaction tank,*” the heater and detector being “*both mounted on the same layer of said bottom plate inside said micro reaction tank.*” This arrangement provides very precise control of reaction temperatures since the heater and detector are both mounted on the same layer inside the reaction tank. In contrast, Handique’s heater is located under a microfluid passage, as shown in Fig. 10B, and is not located in any sort of PCR reaction tank.

The reason that Handique's temperature sensor and heater are not located in a reaction, as in the claimed invention, is that Handique disclose a different type of biochip than the claimed invention. The functions of the temperature sensor and heater of Handique are not analogous to those of the claimed invention, and therefore are not suggestive of the claimed temperature sensor and heater, and in particular location of the claimed temperature sensor and heater on a same layer inside the reaction tank. To the contrary, Handique's biochip does not use a PCR reaction tank, but rather microfluidic device that operate by moving discrete micro-droplets through a sequence of determined configurations. The micro-fluidic device of Handique is designed to control the movement of different sample and reagent droplets using members or sub-assemblies made up of vents, valves, heaters, and meters, rather than by PCR reactions in a tank.

Since neither Handique nor Shipwash teaches a PCR reaction tank having the claimed **heater** and **sensor** on a **same layer inside** the tank, it is respectfully submitted that neither reference, whether considered individually or in any reasonable combination, would have suggested the claimed invention to those of ordinary skill in the art, and therefore that the rejection under 35 USC §103(a) is improper.

In addition, it is respectfully submitted that Shipwash's use of cloned samples is not relevant to the teachings of Handique since Handique's device involves micro-droplet manipulation rather than polymerase chain reactions in a PCR micro reaction tank. Embedding sensors and/or heaters as taught by Handique might be suitable for analyzing micro-droplets, but is inadequate in the case of PCR tank reactions. As a result, one of ordinary skill in the art would not have thought to combine the teachings of Handique and Shipwash, much less in the manner claimed, and withdrawal of the rejection of claims 1, 2, and 4-20 under 35 USC §103(a) is respectfully requested.

Having thus overcome the sole rejection made in the Official Action, expedited passage of the application to issue is requested.

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Respectfully submitted,

BACON & THOMAS, PLLC



By: BENJAMIN E. URCIA
Registration No. 33,805

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BACON & THOMAS, PLLC
625 Slaters Lane, 4th Floor
Alexandria, Virginia 22314

Telephone: (703) 683-0500

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